

**COMPARISON OF DOE 5480.20A
AND DOE 5480.20**

**PERSONNEL SELECTION,
QUALIFICATION, AND
TRAINING REQUIREMENTS FOR
DOE NUCLEAR FACILITIES**

November 1994

SUMMARY

This report compares DOE Order 5480.20A PERSONNEL SELECTION, QUALIFICATION, AND TRAINING REQUIREMENTS FOR DOE NUCLEAR FACILITIES with DOE Order 5480.20 PERSONNEL SELECTION, QUALIFICATION, TRAINING, AND STAFFING REQUIREMENTS AT DOE REACTOR AND NON-REACTOR NUCLEAR FACILITIES.

Changes from DOE 5480.20 include:

1. GENERIC

- a. Revised Responsibilities and Authorities to reflect current DOE organization.
- b. A requirement for systematic evaluation of training programs by the Operations Office, in accordance with DOE-STD-1070-94, Guidelines for Evaluation of Nuclear Facility Training Programs.
- c. A change in the TIM approval authority for all nuclear facilities to the Operations Office level.
- d. A requirement for submittal and approval of a Training Implementation Matrix to the Operations Office for all new DOE reactor and non-reactor nuclear facilities prior to operations.
- e. Permission to submit addenda or page changes to already approved Training Implementation Matrices. All changes/addenda sheets must be submitted to the Operations Office within 90 days of the issuance of the Order.
- f. Addition of a Contractor Requirements Document section in accordance with the New Directives System Manual.
- g. Removal of staffing and overtime limitations. They are addressed in other DOE Orders. Staffing requirements are addressed in DOE Order 5480.22 and limitations for overtime worked are addressed in DOE 5480.23.

2. SPECIFIC

- a. A requirement for operating contractors to perform periodic systematic evaluations of training and qualification programs.
- b. A requirement to use the systematic approach to training to establish and maintain initial and continuing training programs.

- c. A requirement to use a graded approach to establish the systematic approach to training.
- d. A requirement specifying the content of continuing training programs for job positions that perform functions associated with Engineered Safety features.
- *e. The requirement for Category B reactor operators and senior reactor operators to perform control manipulations was revised to require a minimum of five significant reactivity additions.
- *f. Requirements for the content of written examinations for certified reactor operators and senior reactor operators at Category B reactors were specified, as opposed to listing them as part of the training requirements.
- g. Requirements for the content of written examinations for certified operators and their immediate supervisors at non-reactor nuclear facilities.
- h. Requirements for the conduct and content of operational evaluations for certified personnel at Category B reactors and non-reactor nuclear facilities.
- i. Requirements for control manipulations lists and performance requirements for certified positions at non-reactor nuclear facilities.
- *j. Clarification relative the comprehensive examinations for initial qualification/certification of operators and their immediate supervisors.

The applicable items listed in section 2.0, at a minimum, should be addressed in submittals of TIM addenda or page changes to the Operations Office for approval.

The following is a detailed comparison of the Order which provides specific changes.

COMPARISON OF DOE 5480.20A AND DOE 5480.20

For the purposes of this comparison, DOE 5480.20A is the base document and all statements are made as they apply to the differences or similarities between the two Orders.

1. PURPOSE

There are editorial changes in the Purpose, but the changes do not change the intent of the Order.

2. CANCELLATION

The changes reflect that DOE 5480.20 is cancelled.

3. APPLICABILITY

Renamed from "SCOPE."

a. DOE Elements

This is a new Section that includes clarification of what DOE elements are required to comply with this Order.

b. Contractors

This is a new Section that includes clarification that identifies Attachment 1 as the Contractor Requirements.

4. AUTHORITY/BACKGROUND

This Section has been rewritten and replaces BACKGROUND. Changes were editorial.

5. POLICY AND OBJECTIVES

This Section has been rewritten and replaces PROGRAM REQUIREMENTS. Changes were editorial.

6. REQUIREMENTS

This is a new Section that includes clarification of the information that was previously contained in the PROGRAM REQUIREMENTS section of DOE 5480.20. It includes the requirement that evaluations of training and qualification programs be conducted using DOE-STD-1070-94.

7. RESPONSIBILITIES

This section was changed to reflect the reorganization at Headquarters.

a. Secretarial Officer

Renamed to reflect the title change and removed the requirement to approve certain TIMs.

b. Assistant Secretary for Environment, Safety and Health (EH-1)

Adds:

As the independent element responsible for environment, safety, and health oversight of line management of the Department, shall:

- (a) In coordination with the cognizant Secretarial Officer and Operations Office, perform independent reviews of nuclear facility personnel training and qualification programs using DOE-STD-1070-94, as appropriate, and provide results of these reviews to cognizant Operations Office Managers and Secretarial Officers for resolution; and
- (b) Monitor and audit activities of the cognizant Secretarial Officer and the Operations Office Manager to assure the requirements of this Order are consistently applied.

c. Associate Deputy Secretary for Field Management (FM-1)

This Section identifies the responsibilities of FM-1 for coordinating with Secretarial Officers, Operations Offices, and other Field Organizations to assure that personnel qualification programs at DOE facilities are managed according to the requirements of this Order and that program decisions include training and qualification considerations, as appropriate.

d. Operations Office Manager

TIM approval authority was shifted to the Operations Office Manager. Evaluations conducted by the Operations Office Manager are required to be performed in accordance with DOE-STD-1070-94.

8. IMPLEMENTATION

This section adds the requirement that a TIM be submitted prior to the operation of any new DOE reactor or non-reactor nuclear facility.

Contractors with an approved TIM are required to submit an addendum or page changes to their TIM within 90 days of issuance of DOE 5480.20A to the Operations Office which reflect the changes made as a result of the issuance of DOE 5480.20A.

9. ASSISTANCE

This is a new Section that identifies the Nuclear Operations and Analyses Division as the point of contact for assistance relative to this Order.

10. EFFECTIVE DATE

11. REFERENCES AND DEFINITIONS

Identifies Attachment 2, which contains the references and definitions.

Attachment 1 -- CONTRACTOR REQUIREMENTS DOCUMENT

This attachment places existing contractor requirements in a central location in the Order. These requirements are:

1. Implement the requirements of DOE 5480.20A as they apply to the facility and the position;
2. Prepare and submit a Training Implementation Matrix to the Operations Office Manager for review and approval;
3. Prepare and submit procedures which establish the requirements for granting exceptions to specific training or qualification requirements for an individual to the Operations Office Manager for review and approval;
4. Provide written requests for certification extensions to the Operations Office Manager for approval; and

5. Prepare and submit an assessment of the need for a simulator to the Operations Office Manager for review and approval (Category A test and research reactors only).
6. Perform periodic systematic evaluations of training and qualification programs.

Attachment 2 -- REFERENCES AND DEFINITIONS

References have been added and deleted as follows:

ADDED:

- a. Title 10 Code of Federal Regulations, Part 830.120, Quality Assurance Requirements, which establishes DOE's quality assurance program.
- b. Title 10 Code of Federal Regulations, Part 835, Occupational Radiation Protection, which establishes DOE's radiation protection standards and program requirements for occupational radiation protection of workers at its facilities.
- c. DOE/EH-0256T, Radiological Control Manual, for establishment of radiation protection training programs.
- d. American National Standard, ANSI/ANS 8.20-1991, Nuclear Criticality Safety Training, which contains the training outline, procedures, and responsibilities for providing appropriate nuclear criticality safety training for employees associated with fissile material operations outside reactors.
- e. DOE-TSL-1-93, DOE Technical Standards List, that provides the current list of training-related Guides to Good Practices.
- f. DOE-STD-1070-94, Guidelines for Evaluation of Nuclear Facility Training Programs, of 6-94, which establishes a consistent set of objectives and criteria for organizations and entities who evaluate training and qualification programs at DOE nuclear facilities.
- g. DOE Order 5480.31, Startup and Restart of Nuclear Facilities, which contains detailed requirements regarding starting up nuclear facilities following extended shutdowns.

DELETED:

- a. DOE 5480.18A, Accreditation of Performance Based Training for Category A Reactors and Nuclear Facilities.
- b. DOE 5481.1B, Safety Analysis and Review System, and replaced it with DOE 5480.23, Nuclear Safety Analysis Reports.

Definitions have been added, deleted, and changed as follows:

ADDED:

- a. Graded Approach to clear up any ambiguities concerning the use and application of graded approaches. The definition is identical to the one contained in Nuclear Safety Management Rules.
- b. Nuclear Facility to define the types of facilities that are considered nuclear facilities.
- c. Operable to define the applicability of the Order.
- d. Category A and B reactor added the definition previously in DOE 5480.6.

DELETED:

- a. Deleted definition of Operational Safety Requirement and Technical Specification and replaced them with a definition for Technical Safety Requirement.

CHANGES:

- a. Revised definition of Medical Examination to include physician's assistants. This was done to be consistent with the requirements of ANSI/ANS 3.4-1983 and NRC Regulatory Guide 1.134, Rev 2, of 4-87. If the examination is conducted by a physician's assistant, the results of the examination are subject to the review and approval of a licensed physician.
- b. Revised definition of Non-Reactor Nuclear Facility to include the definition rather than referencing the definition contained in DOE 5480.5. This prevents someone from having to go to another document to find the definition and because DOE 5480.5 was canceled by DOE N 1321.140 on May 20, 1994.

CHAPTER I GENERAL REQUIREMENTS

Numerous editorial changes were made to clarify requirements. Unless these changes are of major significance they are not included in this comparison.

1. PURPOSE

Minor editorial changes.

2. TRAINING ORGANIZATION REQUIREMENTS

- * The requirement that the training organization shall be held accountable for providing facility line management with the support necessary to ensure that personnel in the operating organization are qualified to safely and effectively meet job requirements was added.

Clarification was added to account for central training organizations.

3. SUBCONTRACTOR PERSONNEL QUALIFICATION REQUIREMENTS

Minor editorial changes.

4. PERSONNEL SELECTION REQUIREMENTS

Minor editorial changes. The relief from education and experience requirements relative to accredited training programs was removed.

5. QUALIFICATION PROCESS REQUIREMENTS

Changes were made to this section to clarify the qualification process for managers, the technical staff, technicians, maintenance personnel, operators, and their supervisors.

The term performance demonstration is introduced for qualification of operators and their immediate supervisors, technicians, and maintenance personnel.

Radiological control technicians, are required to comply with the *DOE Radiological Control Manual*.

The operating organization is required to indicate by signature that operators and their supervisors have successfully completed requalification programs and are requalified.

This section was revised to indicate that the two year requalification requirement only applies to operators and their immediate supervisors.

A requirement for a comprehensive initial examination as part of the qualification/certification process for operators and their immediate supervisors was added. This has always been the intent, but the revision strengthened the words to eliminate any ambiguity on this issue.

6. CERTIFICATION REQUIREMENTS

This Section has been revised but this revision does not change the intent of the Order.

7. TRAINING REQUIREMENTS

A requirement was added that specifies the use of a systematic approach to training (SAT) when establishing initial and continuing training programs. It also includes a requirement to use a graded approach to establish the SAT for operations personnel, maintenance personnel, technicians, and the technical staff.

a. General

A discussion was added on education and experience requirements for positions identified in the Order as they relate to approval of the TIM (grandfathering). Specifically, this was done to clarify that education and experience requirements are applicable to personnel appointed to positions subsequent to the approval of the TIM.

Clarification was added that suggests that the TIM should identify whether future persons selected for these positions will meet the education and experience requirements or include a request for an exception from the requirements if the requirement is deemed inappropriate on the basis of the hazard involved, the complexity of the operation, or the risk involved.

The statement requiring a review of training programs by training and facility management was changed to just facility management because SAT already requires training programs to be reviewed by training management.

b. Training Process

This section was rewritten to include the requirement that all initial and continuing training programs shall be established by using a systematic approach to training.

This section also provides additional guidance that describes a systematic approach to training. Included is a brief discussion on the phases of the SAT,

writing learning objectives, and how to incorporate alternative methods. This guidance encourages using alternative methods for analyzing training program needs, (i.e., Table-Top Job Analysis) using less formal training and evaluation methods for Category 3 hazard facilities and technical staff, and reduces the level of rigor associated with training media for lower-hazard nuclear facilities.

c. Initial Training Requirements

The phrase "at operable nuclear facilities" was added to the first sentence to reinforce the applicability of DOE 5480.20A to only operable facilities.

d. Continuing Training Requirements

Recommends using DOE-STD-1060-93, *Guide to Good Practices for Continuing Training*, to develop continuing training programs that improve the knowledge and skills of operating organization personnel.

A requirement was added that continuing training programs for qualified positions include, at a minimum, training in significant facility system and component changes, applicable procedure changes, applicable industry operating experience, selected fundamentals with emphasis on seldom used knowledge and skills necessary to assure safety, and other training as needed to correct identified performance problems.

Clarified examination/evaluation requirements but the intent of the Order remained the same.

e. General Employee Training (GET) Requirements

Criticality safety training was added to the list of required GET training.

Changes in GET areas identified in paragraph 7e(1) are required to be included in continuing training programs for all facility personnel. The requirement for re-examination every two years was changed to periodic to be consistent with the continuing training examination requirements.

f. Probabilistic Risk Assessment

No changes.

g. Technician and Maintenance Personnel Training Requirements

A statement was added specifies that training program content for radiological control technicians (RCT) is required to be in accordance with the requirements contained in 10 CFR 835, *Occupational Radiation Protection*, and DOE/EH-0256T, *DOE Radiological Control Manual*. RCT training program elements (i.e., selection, training process, continuing training, qualification) is required to be in accordance with this Order.

h. Technical Staff Training Requirements

Changed title from Technical Support.

No other changes.

i. Management and Supervisory Training Requirements

Changes made were editorial in nature and did not change the intent.

8. OPERATOR AND SUPERVISOR EXAMINATION REQUIREMENTS

The requirement was changed for qualified operator and supervisor candidates whose duties include those that are important to engineered safety features as identified in the Safety Analysis Report to include performance demonstrations instead of operational evaluations.

Clarification was added that examinations should include questions from sources such as Safety Analysis Reports, Technical Safety Requirements, system description manuals, operating procedures, Occurrence Reports, and other applicable sources.

The requirement that the candidates response to oral questions be documented was removed.

9. OPERATOR AND SUPERVISOR REEXAMINATION REQUIREMENTS

Operational evaluation was replaced with a performance demonstration for requalification of operator and supervisor candidates.

Written examination and operational evaluation content for certified operators and certified supervisors was clarified. Written examinations must include a representative sampling of the topics specified in Chapters II, III, and IV to the extent applicable to the position and the facility. Operational evaluations require certified operators and certified supervisors to demonstrate an understanding of, and the

ability to perform, a representative sampling of the control manipulations specified in Chapters II, III, and IV to the extent applicable to the position and the facility.

10. REQUALIFICATION REQUIREMENTS

Changes made were editorial in nature and did not change the intent.

11. EXCEPTIONS TO TRAINING REQUIREMENTS

Clarification regarding testing (i.e., performance demonstrations, written examinations, oral examinations) as the preferred method for excepting persons from specific areas of training was added.

Challenge examinations are addressed.

If challenge examinations are administered, they shall be sufficiently comprehensive to adequately test the learning objective(s) that are stated in the training program. The use of challenge tests is not considered taking an exception to the training and, as such, challenge tests are excluded from the requirements for exceptions contained in preceding portions of this section. Accordingly, they do not need to be approved on a case-by-case basis.

12. EXTENSION REQUIREMENTS

The requirement that a description of the operational and/or schedular situation which necessitated the extension be included in the exception procedure was removed.

13. ALTERNATIVES TO EDUCATION AND EXPERIENCE REQUIREMENTS

Combined education and experience into one section. Clarified that education and experience requirements are consistent with nuclear industry standards for similar positions.

a. Alternatives to Education

Changes made were editorial in nature and did not change the intent.

b. Alternatives to Experience

Changes made were editorial in nature and did not change the intent.

14. DOE STANDARDS

New section.

The section is a discussion on DOE training-related Guides to Good Practices. This paragraph discusses and encourages the use of Guides to Good Practices as being one method that can be used to meet various requirements contained in the order.

15. RECORD REQUIREMENTS

The use of the *Nuclear Information and Records Management Association Guidelines for Management of Nuclear Related Training Records*, TG-17 to help standardize identification, handling, and storage of training records is recommended.

CHAPTER II
Category A REACTOR PERSONNEL

1. PURPOSE

No change.

2. ENTRY-LEVEL REQUIREMENTS

No change.

a. Managers

No change.

(1) Plant Manager

No change.

(2) Operations Manager

No change.

(3) Maintenance Manager

No change.

(4) Technical Manager

Removed requirement that the technical Manager hold or have held a senior reactor operator certification.

(5) Training Manager

The special requirement for holding a senior reactor operator certification was changed to hold or have held.

b. Supervisors

No change.

(1) Shift Supervisor

No change.

(2) Senior Reactor Operator

Clarified that academic or related technical training may be substituted on a one-for-one time basis for power plant experience.

(3) Qualified Supervisor

No change.

c. Technical Staff

Changed title from Technical Support.

(1) Reactor Engineering

No change.

(2) Instrumentation and Control

No change.

(3) Chemistry and Radiochemistry

No change.

(4) Radiation Protection

No change.

(5) Preoperational Testing Engineer

No change.

(6) Startup Testing Engineer

No change.

(9) Shift Technical Advisor

No change.

d. Training Organization Personnel

This is a new section to put training personnel into their own classification. Training personnel were removed from the technical staff section because they are not considered to be technical staff positions.

(1) Training Coordinator

No change.

(2) Training Instructor

No change.

e. Operators, Technicians, and Maintenance Personnel

Changes made were editorial in nature and did not change the intent.

(1) Qualified Auxiliary Operators

Changes made were editorial in nature and did not change the intent.

(2) Reactor Operators

No change.

(3) Technicians

No change.

(4) Maintenance personnel

No change.

3. MEDICAL EXAMINATION REQUIREMENTS

No change.

4. ENGINEERING EXPERTISE ON SHIFT

No change.

5. SIMULATOR REQUIREMENTS

Changes made were editorial in nature and did not change the intent.

6. SPECIFIC TRAINING REQUIREMENTS

No change.

a. Shift Technical Advisor (STA)

No change.

b. Fuel Handling Operations

No change.

c. Control Manipulations

Changes made were editorial in nature and did not change the intent.

d. Reactor Operator Written Examinations

Changes made were editorial in nature and did not change the intent.

e. Senior Reactor Operator Written Examinations

Changes made were editorial in nature and did not change the intent.

f. Operational Evaluations

Changes made were editorial in nature and did not change the intent.

g. Operating Crew/Shift Training

(1) Reactor Operators

No change.

(2) Senior Reactor Operator

No change.

7. OPERATOR PROFICIENCY REQUIREMENTS

Clarified requirements by providing a discussion on the meaning of proficiency. A stipulation for allowing 9 four-hour shifts per calendar quarter to maintain proficiency was added. The following additional requirement for regaining proficiency was added.

(1) Certification is otherwise current and valid;

Requirements were added for proficiency if the reactor is not operated frequently enough to meet established requirements. This section also emphasizes the use of a graded approach to determine the extent of activities necessary to reinstate certification. DOE 5480.31, STARTUP AND RESTART OF NUCLEAR FACILITIES, is referenced for further detailed requirements for facility restart.

ATTACHMENT II-1

Modified to reflect changes made in the chapter.

Removed Note # 14: Job related experience shall be power plant experience.

CHAPTER III Category B REACTOR PERSONNEL

1. PURPOSE

No change.

2. ENTRY-LEVEL REQUIREMENTS

No change.

a. Managers

No change.

b. Supervisors

Changes made were editorial in nature and did not change the intent.

c. Operators

Changes made were editorial in nature and did not change the intent.

d. Technicians

No change.

e. Maintenance Personnel

No change.

f. Technical Staff

Changed title from Technical Support.

g. Training Organization Personnel

This is a new section to put training personnel into their own classification. Training personnel were removed from the technical staff section because they are not considered to be technical staff positions.

(1) Training Coordinator

Same as Chapter II.

(2) Training Instructor

Same as Chapter II with the exception of simulator requirements.

3. MEDICAL EXAMINATION REQUIREMENTS

No change.

4. SPECIFIC TRAINING REQUIREMENTS

No change.

a. Reactor Operator and Senior Reactor Operator

Reactor operator and senior reactor operator positions combined into one.

b. Fuel Handling Operations

No change.

c. Control manipulations

Changed to require the contractor to specify which manipulations are to be performed annually and which are to be performed biennially by reactor operators and senior reactor operators as part of the continuing training program.

A requirement was added for reactor operators and senior reactor operators to perform a minimum of five significant reactivity manipulations for initial certification.

d. Reactor Operator Written Examination Contents

This section was added and contains some of the requirements previously contained in the Senior Reactor Operator Training Section. The remainder of the specific examination content areas were derived from applicable topics from Chapter II to provide consistency in examination content. It also requires that information from Safety Analysis Reports, Technical Safety Requirements, systems description manuals and operating procedures, lessons learned from Occurrence Reports, and other applicable sources be used in preparation of examinations.

e. Senior Reactor Operator Written Examination Contents

This section is new. It contains some of the requirements previously contained in the Senior Reactor Operator Training Section. The remainder of the specific examination content areas were derived from applicable topics from Chapter II to provide consistency in examination content.

f. Operational Evaluations

This is a new section which specifies the requirements for operational evaluations and requires any significant deviations from Category A reactor operational evaluations to be justified in the TIM.

5. OPERATOR PROFICIENCY REQUIREMENTS

Clarified requirements by providing a discussion on the meaning of proficiency and added the following additional requirement for regaining proficiency.

- (1) Certification is otherwise current and valid;

This section also emphasizes the use of a graded approach to determine the extent of activities necessary to reinstate certification. DOE 5480.31, STARTUP AND RESTART OF NUCLEAR FACILITIES, is referenced for further detailed requirements for facility restart.

ATTACHMENT III-1

Added training coordinators and training instructors and added notes to correspond to these positions.

CHAPTER IV NON-REACTOR NUCLEAR FACILITY PERSONNEL

1. PURPOSE

No change.

2. ENTRY-LEVEL REQUIREMENTS

No change.

a. Managers

No change.

b. Supervisors

Changes made were editorial in nature and did not change the intent.

c. Operators

Changes made were editorial in nature and did not change the intent.

d. Technicians

Changes made were editorial in nature and did not change the intent.

e. Maintenance Personnel

No change.

f. Technical Staff

Changed title from Technical Support.

g. Training Organization Personnel

This is a new section to put training personnel into their own classification. Training personnel were removed from the technical staff section because they are not considered to be technical staff positions.

(1) Training Coordinator

Same as Chapter III.

(2) Training Instructor

Same as Chapter III.

3. MEDICAL EXAMINATION REQUIREMENTS

No change.

4. SPECIFIC TRAINING REQUIREMENTS

A statement was added that the depth and scope of training and qualification programs for operating organization personnel at non-reactor nuclear facilities is required to be commensurate with the hazard level and complexity of the operations (i.e., a graded approach should be used to develop and implement the training programs). This section provides specific training requirements for operators, fissionable material handlers, and supervisors.

a. Operators

Changes made were editorial in nature and did not change the intent.

b. Fissionable material Handlers

No change.

c. Supervisors

Changed the requirements to reflect what should be included in their training program.

d. Certified Operator Written Examination Contents

This section was added and contains some of the requirements previously contained in the Supervisor Training Section. The remainder of the specific examination content areas were derived from applicable topics from Chapter II to provide consistency in examination content. It also requires that information from Safety Analysis Reports, Technical Safety Requirements, systems description manuals and operating procedures, lessons learned from Occurrence Reports, and other applicable sources be used in preparation of examinations.

e. Certified Supervisor Written Examination Contents

This section is new. It contains some of the requirements previously contained in the Supervisor Training Section. The remainder of the specific examination

content areas were derived from applicable topics from Chapter II to provide consistency in examination content.

f. Operational Evaluations

This is a new section which includes the actions necessary to accomplish a representative operational evaluation.

g. Control manipulations

This is a new section which specifies that the contractor prepare a list of control manipulations based on an analysis of the job. The list is required to specify which manipulations are to be performed annually and which are to be performed biennially by certified operators, fissionable material handlers, and certified supervisors as part of the continuing training program.

5. OPERATOR PROFICIENCY REQUIREMENTS

This section was changed to Clarify proficiency requirements by providing a discussion on the meaning of proficiency and added the following additional requirement for regaining proficiency.

(1) Certification is otherwise current and valid;

This section also emphasizes the use of a graded approach to determine the extent of activities necessary to reinstate certification. DOE 5480.31, STARTUP AND RESTART OF NUCLEAR FACILITIES, is referenced for further detailed requirements for facility restart.

ATTACHMENT III-1

Added training coordinators and training instructors and added notes to correspond to these positions.